



# Space News Roundup

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No. 15

## Earth Day to highlight environment

JSC will be joining in a national celebration of the planet and the environment Thursday during the Worldwide Earth Day observance.

Earth Day 1993 is the center's second celebration of the annual event. Last year more than 300 people attended the JSC exhibition.

Coordinator Jo Kines said the response following the 1992 Earth Day observance was largely positive and hopes "word of mouth" will increase the attendance at this year's exhibition.

As part of the celebration, a number of local organizations and environmental specialists will be available to provide information on ecological, environmental and other "Earth" subjects.

A total of 17 different exhibitors are expected for Earth Day 1993. Many of last year's exhibitors are returning this year, but there are several new participants, Kines said.

Exhibition subjects range from those of global concern, such as endangered species and observation from space, to those of more local interest, such as recycling, bicycling and conservation. The observance also will include live animal exhibits.

"JSC is committed to supporting environmental protection and is pleased to provide this opportunity to enhance environmental awareness," said Center Operations Director Grady McCright.

The exhibits will be open from 10 a.m. to 2:30 p.m. Thursday in the north exhibit area of Bldg. 2. Civil service and contractor employees are encouraged to support this activity as workloads permit.



**STS-56 Commander Ken Cameron (left) peeked in on Mission Control while *Discovery* flew 160 nautical miles above it using the Shuttle Amateur Radio Experiment fast-scan television equipment. The NASA Select transmission was sent from the JSC Ham Radio Shack where operators including Ruth Barrett and Paul Agner (above) have been conducting the SAREX activities for the mission. Crew members also talked with students around the world, including two local schools, as part of the SAREX activities. All five STS-56 crew members are licensed amateur radio operators.**

JSC Photo (top) by Bob Walck

## Discovery completes its mission

By Kari Fluegel

STS-56 came to a close last week when crew members finished their solar and Earth observations and prepared the Atmospheric Laboratory for Applications and Science-2 instruments for *Discovery's* return home.

As of presstime, landing was scheduled for 6:33 a.m. Friday at the Kennedy Space Center, but weather in Florida was threatening to extend the mission to Saturday.

Commander Ken Cameron, Pilot Steve Oswald and Mission Specialists Mike Foale, Ken Cockrell and Ellen Ochoa were launched from the Launch Pad 39-B April 8 to spend nine days working with the ATLAS-2 and the SPARTAN-201 satellite. Once on orbit, the five-member crew split into two teams for around-the-clock payload activities.

Despite problems with transmitting high-rate data from the Atmospheric Trace Molecule Spectroscopy experiment early in the flight, ATLAS-2 investigators were pleased with the solar and atmospheric information collected during the mission.

Mission Scientist Tim Miller said each of the three atmospheric experiments—the Millimeter Wave Atmospheric Sounder, the Shuttle Solar Backscatter Ultraviolet experiment and ATMOS—collected more data than they did during the ATLAS-1 flight in 1992.

"The mission has more than lived up to our expectations," Miller said.

ATLAS-2 is the second in a series of missions designed to study the Earth's atmosphere and the Sun's effects on the atmosphere.

"The most important application of this mission is to understand the effects of human activity on the atmosphere and separate them from the effects of natural consequences such as variations in the sun's energy," Ochoa said while speaking to students in an in-flight interview.

"The more we know about that, the more we as people on Earth will be able to respond to changes in the

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## Bobola, Shelley take new posts in station projects office

Robert E. Bobola and Carl B. Shelley have been named deputy manager and deputy for project control, respectively, in the Space Station Projects Office, JSC Director Aaron Cohen announced this week.

Shelley's post is a new position established to emphasize and enhance the business management performance of the project office, Cohen said. Shelley will be responsible for integration of the

cost, schedule, contract engineering and overall space station projects planning activities required to supplement technical management performance.

Shelley will be responsible for developing the projects control organization so it is compatible with the model being developed for JSC following the recent findings of the JSC Independent Program Control Assessment Team. The manager

of the Management Integration Office will report directly to Shelley, and the manager of the Project Control Office will provide institutional support.

More specifics of the projects control enhancement function will be defined as the activity matures.

Shelley began his career at JSC more than 27 years ago following service in the U.S. Air Force. He has held numerous positions at the center

including deputy director of Mission Operations, manager of the Customer Integration Office in the Space Station Program Office, manager of the Operations Office in the Mission Operations Directorate, and deputy manager of the Space Station Projects Office. Most recently, Shelley served as deputy manager for Program and Operations Integration in the Space Station Projects Office.

Bobola most recently served as deputy manager for development in the projects office. He came to JSC in 1959 and was assigned to the NASA Space Task Group. Since that time he has held numerous positions including chief of the Orbiter Project Engineering Office, deputy manager and manager of the Orbiter Engineering Office.

Both reassignments are pending approval by NASA Headquarters.

## Budget plan marks new way of doing business

By Kari Fluegel

NASA's budget request of \$15.265 billion for Fiscal 1994 represents a lot of hard work and marks a change in the way the space agency will be doing business in the future, Administrator Daniel Goldin said last week.

"This budget represents a fiscal declaration of independence from the old ways of doing business at NASA," he said. "It represents our independence from old technology, from old ideas and old assumptions."

"This spending plan will move us out of the fog of bureaucracy, past the old patterns that were seriously threatening our ability to execute a broad mix of vital programs in the future. It represents a rejection of the vested interests, and the embrace of a changed and very challenging set of priorities at NASA."

Goldin said the agency received a difficult challenge from President Bill

Clinton to make significant cuts in NASA's spending over the next five years while making programs more relevant to America.

First, the agency started with the Fiscal 1993 budget and extrapolated a five-year spending plan, arriving at a projected NASA expenditure of \$96.1 billion. Then, \$23.8 billion was cut leaving a total five-year expenditure of \$72.3 billion, Goldin said.

To arrive at a final figure, \$8.1 billion was added back in the form of new programs and technology packages such as shuttle improvements, aeronautic research, new technology investments and development of the Advanced Solid Rocket Motor.

"The bottom line is, we are projecting a net reduction in NASA spending over the next five years of about \$15 billion," Goldin said. "At our current funding level, that is equivalent to deleting an entire year's worth of funding out of our

five-year plan."

The reductions were made in many areas, but most significantly in the space station budget. Using the FY 1993 station allocation, NASA would have had a funding level of \$15.1 billion. However, the Office of Science and Technology Policy recently announced three budget options for the redesigned station program — a low option of \$5 billion, a mid-range option of \$7 billion, and a high option of \$9 billion.

Using the mid-range option, for example, NASA will reduce the five-year station budget plan by \$8 billion, Goldin said.

He also noted that the administration has not made a decision on the station funding level, and the exact funding level will be dependent on the outcome of the redesign effort.

The shuttle spending plan will be reduced by \$3.4 billion over the next five years. The budget plan for

the shuttle program using FY94 figures totals \$19.4 billion as compared to \$22.8 billion using the FY93 numbers.

Goldin said NASA is also going after infrastructure costs. There will be a reduction of \$2.8 billion in that area from \$18.5 billion to \$15.7 billion over the next five years.

"Under space communication, we have delayed the advent of Tracking and Data Relay Satellite-II costs," he said. "We will procure one to three functional equivalent replacements for the TDRS satellites as necessary to buy us the time to sort out our requirements. There is no hurry, and this gives us the opportunity to challenge ourselves and industry to come up with new and innovative approaches in both management and technology."

Overall, the space communications plan will be reduced \$1.5 billion from \$6.8 billion to \$5.3 billion; the

construction of facilities plan, will be reduced \$600 million from \$2.2 billion to \$1.6 billion; and civil servant costs, will be reduced \$700 million from \$9.5 billion to \$8.8 billion.

"It is our goal to utilize attrition and other approaches to reduce Civil Service costs by \$700 million, rather than to impose any reductions in the next five years."

Additional savings were found by restructuring the Cassini and Advanced X-Ray Astrophysics Facility programs. Both programs will cut \$300 million from their programs taking Cassini from \$1.7 billion to \$1.4 billion and AXAF from \$1.9 billion to \$1.6 billion over the next five years.

The Earth Observing System program also was restructured, saving \$2 billion. EOS's five-year spending plan now totals \$5.1 billion rather than the previous \$7.1 billion.

Please see **PLAN**, Page 4

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# Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Gift Store from 10 a.m.-2 p.m. weekdays. For more information, call x35350 or x30990.

EAA/JSC Picnic (May 1, Gilruth): adult, \$5; child, \$3; ticket price increases \$1 after April 27. Picnic will feature Barney, James Coney Island, Velcro Wall, Pony Carousel, Petting Zoo and Mr. T.

EAA Galveston Historic Homes Tour (May 1-2 and 8-9): \$11.

Astroworld Early Bird Special — Tickets purchased before May 31 and used before June 30 at \$15.95.

Sea World in San Antonio — Discount tickets: adult, \$19.75; child (3-11), \$13.15.

Fiesta Texas, San Antonio — Discount tickets: adult, \$18.35; child (4-11) \$12.75.

Space Center Houston — Discount tickets: adult, \$7.50; child (3-11) \$4.50; commemorative: \$8.75.

Metro tickets — Passes, books and single tickets available.

Movie discounts — General Cinema, \$4.50; AMC Theater, \$3.75; Loews Theater, \$4.

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# Gilruth Center News

**Sign up policy** — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a badge or EAA membership card. Classes tend to fill up four weeks in advance. For more information, call x30304.

**EAA badges** — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday through Friday. Dependents must be between 16 and 23 years old.

**Defensive driving** — Course is offered from 8 a.m.-4:30 p.m. May 15. Cost is \$19.

**Weight Safety** — Required course for employees wishing to use the Gilruth weight room is offered from 8-9:30 p.m. April 20. Pre-registration is required; cost is \$5.

**Aerobics** — High/low-impact classes meet from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

**Exercise** — Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

**Aikido** — Martial arts class meets Tuesdays from 6:15-8 p.m. Cost is \$15 per month.

**Volleyball / Basketball** — Sign-ups will be held for the next season during the week of April 19. See flyers or call the Gilruth Center for additional information.

**Self-defense workshop** — Learn what you can do to be better prepared at a free self-defense workshop from 5-6 p.m. April 21. Call x30304 to reserve a seat.

**Fitness program** — Health Related Fitness Program includes medical examination screening, 12-week individually prescribed exercise program. Call Larry Weir, x30301.

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# Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

## Property

Sale: Friendswood/Regency Estates, 3-2-2, 1.5 story w/game rm, master dn, lg country kitchen, FPL, privacy fence, home warr, \$89.9K. Jim, 482-8800.

Sale: Dickinson Bayou waterfront, 4-2-5-2, pool, 100 yr old trees, WBFP, volleyball, horse-shoe setup, \$224K. x34354 or 337-1640.

Rent/Sale: Oakbrook West, 3-2-2, 1800 sq ft, pool, detach gar, lg patio, \$975/mo or \$105K. 480-3260.

Lease: Pipers Meadow, 3-2-2, carpets, drapes, FPL, fenced, builtins, \$825. 538-3352.

Rent: Orlando, 2 BR condo, full kitchen, sleeps 8, Epcot entrance at Hwy 4, June 13-20, \$500 OBO. Phil, x47346 or 538-1665.

Sale: 4-3-2D, study, game rm, screen porch, kitchen w/Jennaire, new ceramic tile, lot w/trees, pkg boat/motorhome, \$124.9K. Shirley, 335-0641.

Sale: LC, lot, 82' x 130', \$10K. x36514.

Sale: Bandera/Hill Country, 1 acre lot in development w/pool, Medina River frontage w/27 acre park, util, good roads. Plauche, x39034 or 474-2660.

Lease: New Heritage Park, 3-2-2, formal, high ceilings, FPL, garage opener, patio, pet ok, \$785/mo + dep. 486-5527.

Sale: Alvin, new Tilson built 3-2 on 2 acres. Katie, x47687.

Sale: Pearland, 4-2-5-2, game rm, formals, sunroom, jacuzzi, marble vanities, low util bills, 6 ceiling fans, \$104K. Gloria, 480-2771 or 485-7555.

Sale: Baylor Univ, condo, lower college costs/IRS deduction. x49804 or 334-3896.

Lease: CLC, 1 BR condo, micro, FPL, tennis, exer rm, upstairs, W/D conn. Jim Briley, x44632 or 488-7901.

Rent: Arkansas cottage, furn, wooded, 4 acres, screened porch, antiques, \$250/wk, \$50/day. x33005 or 538-4141.

Sale: El Dorado Trace condo, 1-1-5-1cp, all appl, patio, balcony, FPL, fans, designer carpets/wallpaper, low equity assum or FHA approved. Barbara, 488-3383.

Rent: Galv condo, furn, sleeps 6, Seawall & 61st St, cable, wknd/wkly/daily. Magdi Yassa, 333-4760 or 486-0788.

Sale: Univ Trace condo, 2-2-2 cp, split BR, ground floor, new carpet/vinyl, paint/wallpaper/miniblinds, FPL, W/D, refrig, \$38K. x31790 or 488-1720.

Rent: Dickinson, 4-2-1, formal room, living room, \$700/mo. 534-2179.

Sale: Lake Conroe, Bentwater lot, Sec. 29, incl country and yacht club membership, 2 pools, 2 golf courses, \$25K. Mike, 482-8058.

## Cars & Trucks

'86 Nissan PU, L.B. 4 cyl, good cond, as is,

\$3.5K OBO. 424-1312.

'80 Volvo station wagon, diesel, leather int, new tires, \$2.7K. x48149.

'71 Classic Chevy Nova, V8, orig owner, \$4.5K. 480-1998.

'88 Holiday Alumalite, '35 MH, 29K mi, 454 Chev, 6.5 Onan gen, 2 roof AC/s, hydraulic leveling jacks, rear qn bed, sleeps 7, new tires, \$34K negotiable. Joe, 283-6508 or 337-3696.

'79 Datsun 280ZX, new paint, 92K mi, \$2.2K. x32458 or 333-9518.

'90 Chevy Astro van, 60K mi, air, pwr, \$7250. 480-7758.

'83 Volvo GLE turbo, 5 spd, sunroof, silver/blue, AM/FM, \$2.4K OBO. 474-4132.

'85 Lincoln TC, loaded, ex cond, vinyl roof, one owner, \$4.5K. 488-1320.

'90 Toyota Corolla, 4 DR sedan, auto, AC, PS/PB, AM/FM, new tires, 50K mi, 100 mile warr, ex cond, \$6.3K. 480-7338.

'78 Porsche 928, brwn w/leather int, auto, ex cond, 75K mi, \$8.5K. Bill, x48889.

'90 Isuzu Spacecab PU, 5 spd, blk, 29K mi, AC, AM/FM/cass, tint, alarm, warr, ex cond, \$8K. John, 478-5509.

'91 Olds 98 Regency Elite, loaded, 14.5K mi, ex cond. Karen, 282-4013 or 480-1213.

'85 Honda LX, 4 DR, pwr, loaded, new tires, ex cond, \$2.8K OBO. x45142 or 286-5731.

'69 Ford Ranger for parts, good engine, bench seat, new starter, all \$300, or \$250 for eng. 339-1152.

'71 Corvette Coupe, green, new saddle int, orig eng, \$10.5K; '91 Chevy S10 Blazer, dk blue, lt blue int, Tahoe pkg, ex cond, \$10.5K. Bob A, x34409 or 393-1670.

'84 Mazda 626 Coupe, 82K mi, 5 spd, AC, cruise, AM/FM/cass, silver w/dk blue int, ex cond, \$2.3K. x38604.

'84 Mazda RX7, 5 spd, AC, sunroof, ex cond, \$2.2K. Mike, x45888 or 941-3291.

'91 Jeep Renegade, hardtop, AC, loaded, red on blk, 12K mi, ex cond, \$15.9K; '90 Lincoln TC, Signature Series, wht/gray, loaded, car phone, low miles, \$18.9K. Tom, x41119 or 534-4958.

'80 Honda Civic Station Wagon, 5 spd, AC, AM/FM/cass, new brakes, good cond, \$1.2K. x37883 or 337-5482.

'86.5 Toyota Supra, deep blue, auto, full pwr, leather, tint, maint log, \$5.9K. Ed, x38309 or 409-925-8051.

'87 Ford Tempo, standard trans, 85K mi, \$1K. 538-1051.

'91 Nissan Stanza XE, wht, auto, AC, cruise, AM/FM, 40K mi, \$8490. 286-1640 or 333-6355.

## Boats & Planes

'90 Kawasaki 650 sx, jet ski, dbl trlr, runs great, \$3.5K. Andy, x48523 or 334-4988.

'16' Laser sailboat, needs some work on mast, fiberglass, ex cond, \$500. 538-1051.

## Cycles

'81 Siverwing, factory fairing and saddlebags, 22K mi, \$1K. Seth, 334-5321.

'90 Yamaha radian, red, 9K mi, \$2.6K. James, 286-1934.

Mtn bk parts, 1 1/8 Kalloy stem, oversize forks, 1 1/8 headset, \$10 ea; Shimano

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# Dates & Data

## Today

**Cafeteria menu** — Special: ham-burgery steak. Entrees: beef Burgundy over noodles, fried chicken. Soup: cream of chicken. Vegetables: buttered corn, carrots, green beans.

## Tuesday

**Cafeteria menu** — Special: turkey and dressing. Entrees: baked meatloaf, liver and onions, barbecue spare ribs. Soup: beef noodles. Vegetables: Spanish rice, broccoli, buttered squash.

## Wednesday

**Toastmasters meet** — The Spaceland Toastmasters Club will meet at 7 a.m. April 21 at the House of Prayer Lutheran Church at the corner of Bay Area Blvd. and Reseda Drive. For more information, call Jim Morrison at 480-9793.

**TQM Brown Bag Seminar** — Eugene Burger of MITRE Corp. will discuss "Metrics Initiative" at a Total Quality Management Brown Bag Seminar from noon to 1 p.m. April 21 in Bldg. 12, Room 254 and 256. For more information, contact Roberta Beckman at x38525.

**Cafeteria menu** — Special: Spanish macaroni. Entrees: broiled fish, tamales with chili. Soup: seafood gumbo. Vegetables: ranch beans, beets, parsley potatoes.

## Thursday

**Computer group meets** — The Society for Computer Simulation will conduct its April meeting at 11:45 a.m. April 22 at Lockheed Plaza 3, 1150 Gemini Ave., in the

first floor Pic Room. Laurie Sprague of the LinCom Corporation will discuss "Anatomy Meets Virtual Reality—Virtual Visual Environment Display." The meeting is open to everyone and no reservations or badges are required. For more information, contact Robin Kirkham, 333-7345, or Margaret Klee, 333-6365.

**Cafeteria menu** — Special: chicken fried steak. Entrees: beef pot roast, shrimp chop suey, pork chops. Soup: navy bean soup. Vegetables: carrots, cabbage, green beans.

## Friday

**Lunch and learn** — The American Institute of Aeronautics and Astronautics' Computer and Software Systems Technical Committee will present a lunch and learn meeting at 11:45 a.m. April 23 in Lockheed Plaza 3. Michael O'Dell, Beth Lawrence and Richard Astrom will discuss "SEI Capability Maturity Model: A Better Way to Build Software." For more information, call Cora Carmody at 282-6580, or Tek Shrini at 282-6643.

**Cafeteria menu** — Special: tuna and noodle casserole. Entrees: broiled codfish, fried shrimp, baked ham. Soup: seafood gumbo. Vegetables: corn, turnip greens, stewed tomatoes.

## Sunday

**Choral concert** — The Bay Area Chorus will continue its spring season with a concert at 4 p.m. April 25 at Lakeside Lutheran Church, 3025 South Shore Dr. in League City. Cost is \$8 for adults, \$5 for stu-

dents and senior citizens; proceeds support the Bay Area Chorus Scholarship Fund. For more information, call 684-6030.

## Monday

**Cafeteria menu** — Special: meatballs and spaghetti. Entrees: wieners and beans, round steak with hash browns. Soup: chicken noodle. Vegetables: okra and tomatoes, carrots, whipped potatoes.

## April 27

**Blood Drive** — The NASA Blood Drive will continue from 8 to 11:30 a.m. April 27 at Grumman, 12000 Aerospace. For more information, contact Freddie Ann Marcussen at 929-7123.

## April 28

**NMA meets** — The JSC chapter of the National Management Association will meet at 5 p.m. April 28 in the Gilruth Center. Members will discuss long-range planning at JSC. Reservations are due by April 21; members should contact their boosters and non-members should call Allison Kruest at x47115.

**Astronomy seminar** — The JSC Astronomy Seminar will feature an open discussion meeting at noon April 28 in Bldg. 31, Rm. 129. For more information, call Al Jackson at 333-7679.

**Freedom Fighters meet** — The Space Station Freedom Fighters will meet at noon and 5 p.m. April 28 in Rm. 526 of the McDonnell Douglas Tower, Space Center Blvd. and Bay Area Blvd. For more information, call David Cochran at 482-7005.

DEORE LX 170mm cranks, \$70. Trey, x36759 or 992-1076.

'88 Hurricane, red/blk, 18K mi, \$2.7K OBO. x34204 or 480-2954.

## Audiovisual & Computers

Brothers wordprocessing elec typewriter, 12K character, memory w/unlimited files, auto fonts, formatting, 40 character display, spellcheck, \$150. Beth, x33078.

Nintendo game sys, 5 games, light gun, 5 Nintendo magazines, was \$260, now \$125; Gameboy w/3 games, \$100. Don, 244-4666 or 486-6726.

MacPlus, Imagewriter printer, sw, \$400 OBO. Brian, x30147 or 286-2011.

Technics stereo receiver w/2 bookshelf spkrs, \$150; 19" color tv, cable ready, w/remote, \$150. Donald Thompson, x36852 or 332-8017.

Pioneer 45 w receiver, cass, Realistic 10 band equalizer, Advent Prodigy Tower spkrs, \$395 OBO. James, x33571 or 337-5583.

5' x 5' entertainment center, \$50; DP weight bench/weights, \$30. x33662.

Nintendo entertainment sys, 3 controllers, pwr glove, pwr pad, light gun, 9 games, \$180 OBO. Keith, 482-5190.

286 PC, 2/40, VGA monitor, Logitech mouse, int 2400 modem, ex kybd, 5.25 floppy, Brother dot matrix printer, computer desk, sw, \$700. 334-5143.

Epson LQ-2500 letter quality printer w/color print adapter, ribbons, paper, \$400; ATT 6300+ w/EGA card, NEC Multisync monitor, 2 Mb RAM, 30 MB HD, mouse, modem, \$600. Chris, x30794.

Seagate 120 MB HD for IBM, 6 mo old, \$250; Amazon super VGA adventure game, \$35 or trade for Dagger of Amon-Ra. Trey, x36759 or 992-1076.

IBM XT clone, 64K RMA, 40 MB HD, CGA card, amber monitor, 1200 baud int modem, \$400 OBO. x45050.

## Photographic

Nikon FG-20 body, Nikon 50mm 1.8 lens, Sakar 80-200mm lens, Toyo 28-135 lens, Vivitar 285 HV elec flash, case, \$475 OBO. Dave, x37058 or 860-0736.

## Pets & Livestock

Free, female cat, spayed. 554-2532.

Free, 1/2 yellow lab, male, ex watchdog, likes kid, need big yd/open land. 488-5944.

## Musical Instruments

Arbor elec guitar, Fender amp, new cond, \$350. James, 286-1934.

Rickenbacker elec guitar, small practice amp, \$350 OBO. Glen, 332-1852.

## Household

Lt cream colored qn sz sofa hide-a-bed, \$300; matching Laz-y-Boy recliner, \$100. Mike, 333-6152 or 486-9876.

Wood stove, \$100, Jelly cupboard, \$225; Pine cabinet for tv, \$350; Pine cabinet, \$275; Red desk, \$130, 6 ladderback chairs, \$100; rocking chair, \$125; Farmers tbl, \$175; assorted ladderback chairs, \$20; loveseat, \$75; chair, \$35 or both \$100; 2 wood plant stands, \$35. 996-1442.

GE side-by-side refrig/freezer; custom water/ice dispenser, lg 27 cu ft, almond textured finish, \$750. x48149.

Navy blue/burgundy sofa, \$325 OBO. Julie, x36459 or 326-3118.

Lt oak baby crib, \$65; marble coffee tbl, \$75. Jerry, x38835 or 474-3931.

2 traditional chairs, \$65; tbl lamp, \$20; tortise shell hanging lamp, \$20; Pier 1 hanging lamp, \$20. Phil, x33640.

Craftmatic kg sz adjustable bed w/vibrator/heat, 2 yrs old, ex cond, was, \$3.4K, now \$1250 OBO. Jeff, x41132 or 286-2060.

Twin sz matt, box springs, frame, ex cond, \$75. Karen, 480-1658.

Wht Kenmore heavy duty elec dryer w/new motor, \$100; qn sz waterbed w/backrest hdbd/bedding, \$100; 2 pwr wheel 4 x 4 elec cars, both need batt, \$50/ea. Phil, x47346 or 538-1665.

Vitamaster row machine, \$20 OBO; modern sofa, \$50 OBO; brass/glass dinette set, \$50 OBO; Laz-y Boy recliner, \$25 OBO; brass floor lamp, \$15 OBO; Magic chef full sz microwave, \$100 OBO; 4 bar stools, \$5/ea. 332-7201.

6 ft couch, brwn/beige, good cond, \$25; dbl bed w/box springs, hd/ftbd/frame, \$25; '81 Volvo station wagon for parts, \$300. Heidi, 335-1668.

5 pc sec w/rocker/recliner, green w/mauve/gray pinstripping, 1.5 yrs old, \$1250; 6.6 cu ft GE refrig w/blk face, 1.5 yrs old, \$1150. x41119 or 534-4958.

Kenmore lg capacity washer, good cond, \$140; Kenmore gas dryer, \$20; Oreck upright vacuum, \$25. Diana, x38680.

'52" oak tbl, claw feet, 4 chairs, \$600; Miller beer light, guitar shape, \$50, break in one line. 339-1152.

GE 23.5ft3 refrig w/door ice dispenser, \$250; custom couch, \$200; round oak tbl w/6 chairs, \$60. x44570 or 482-6879.

Antique vanity, '30's lg mirror, classic look, near perfect, \$600; antique clock, mantle style, \$1.2K. Bob, x33149.

Brass lt fixtures w/smoked, etched, beveled glass, 4 different; beige tweed sofa/love seat. Cindy, 992-5285.

1.2 cu ft refrig, brwn, suitable for office or dorm, \$80. 326-2186.

GE washer, elec dryer, \$150 OBO for both. Nelson, 282-5229 or 334-1008.

Full bed, wht hdbd w/shelf, foot board, matt, springs, incl., \$150. x32188 or 488-5944.

## Wanted

Want students to join Russian language class, intermediate/beginner level, 6 mos - 2 yrs exp. Rick, x47373 or Keith, x38024.

Want sturdy weight bench, chin-up bar, dip bar. 486-9605.

Want small motorcycle running or not. Andy, 332-9105.

Want roommate to share LC 3-2-2 with me and 2 outdoor dogs, priv 2 BR, bath, \$290/mo + 1/2 util, avail 5-1. Sharon, x33019 or 554-6741.

Want to buy used Dodge Colt Vista or Honda. 867-8820.

Want Starwars spaceships, toys, figures, books. Ron, 482-1385.

Want someone to rent unfurn rm in Friendswood, \$150/mo incl util. x47049.

Want cheap work/school car w/AC. Phil, 488-4700.

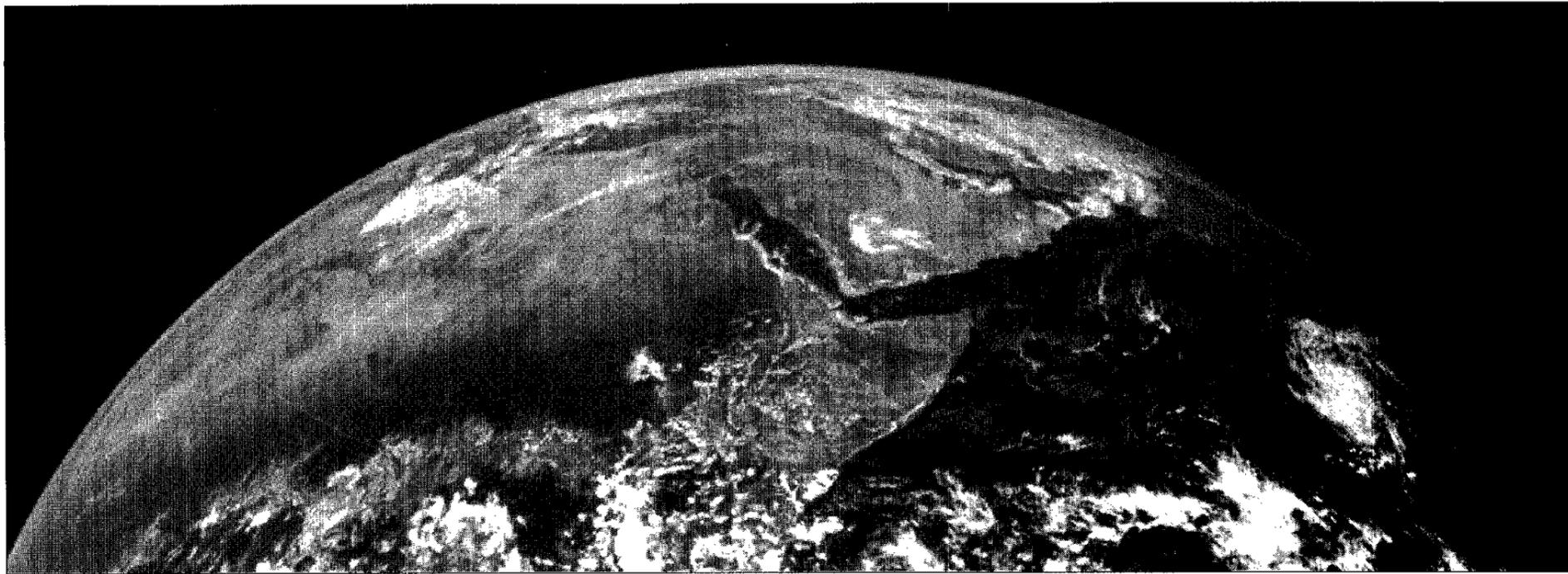
## Miscellaneous

DP Gym Pack w/free weights, incl bench/leg ext, \$125. Lora, x37737 or 326-3728.

Concept II rowing ergometer rowing machine, displays meters rowed, calories used, watts, time, 3 yrs old, ex cond, \$600 OBO. 488-4913.

Kubota L2550, 148 hrs, 5' disk, 5' box blade, 52" Kubota roto-tiller, post hole digger w/9"12" augers, 16" Tandem drive-on till trlr w/brakes, \$11K. 471-4100.

Medical



# Mission to Planet Earth

## NASA studies global changes to understand Earth's processes

By Kari Fluegel

In photographs from Apollo 8, we looked at our world from a new, fantastic perspective for the first time. We saw Earth as a blue and inviting place, a small oasis alone in the vast blackness of space. We beheld the magnificence of the oceans and the beauty of the land. We viewed the power of the weather currents and the curtain of thin atmosphere that surrounds us.

Then we started looking closer. We spotted scars on the land. We observed smog clouding the sky. We witnessed forests and lakes disappear. We noticed our delicate climate being changed by both natural and unnatural forces.

Phrases such as "ozone depletion" and "greenhouse effect" are now part of our vocabulary. We look at planets like Mars and Venus wonder if the Earth will end up as just another uninhabitable globe.

But before the damage can be undone, we must understand the processes that create and destroy the Earth's delicate balance. We must answer questions about the composition and behavior of the environment.

In the report "Leadership and America's Future in Space," former Astronaut Sally Ride used the phrase "Mission to Planet Earth" for the first time when she outlined four initiatives for the civilian space program.

"Mission to Planet Earth is an initiative to understand our home planet, how forces shape and affect its environment, how that environment is changing and how these changes will affect us," the report says. "The goal of this initiative is to obtain a comprehensive scientific understanding of the entire Earth system, by describing how its various components function, how they interact, and how they may be expected to evolve on all time scales.

"The challenge is to develop a fundamental understanding of the Earth system

and of the consequences of changes to that system, in order to eventually develop that capability to predict changes that might occur—either naturally or as a result of human activity."

Following that report, NASA began a global-scale examination of the Earth to study the interaction of all the environmental factors—air, water, land and biota—that make up the Earth system with the goal of developing accurate predictive models that can help inform decision makers about global environmental trends.

NASA has launched five missions since 1991 specifically designed to study and monitor the Earth's atmosphere and its changes. Several more are planned throughout the decade.

The first Mission to Planet Earth satellite—the Upper Atmosphere Research Satellite—was placed in orbit during STS-48 in September 1991 and is making comprehensive measurements of dynamic, radiative and chemical processes in the upper atmosphere and their interactions. These data will help determine the extent and durability of the stratospheric ozone layer.

Other satellites now in orbit include TOPEX/POSEIDON, a U.S.-French ocean-topography satellite, and LAGEOS-II, a small mirror-covered spacecraft that will provide information on Earth's geodynamics.

TOPEX/POSEIDON was launched on a French Ariane rocket in August 1992. The satellite will provide the first detailed measurements of the oceans' global circulation patterns, including the manner by which currents, such as the Gulf Stream, distribute heat across the globe.

A joint mission with Italian Space Agency, LAGEOS-II provides information on plate tectonics and tides by bouncing laser beams fired at it back to Earth. LAGEOS-II, was launched in October during STS-52.

Space shuttles also have carried several attached payloads to support the Mission to Planet Earth objectives. The Atmospheric Laboratory for Applications and Science missions carry instruments on pallets in the shuttle's payload bay to study the sun's effects on the atmosphere during a full 11-year solar cycle. These highly calibrated instruments investigate atmospheric science and solar science questions related to global change and check measurements made by similar instruments on other satellites. Two ATLAS missions have flown so far including the recent STS-56.

The Shuttle Solar Backscatter Ultraviolet experiment, which also flew on STS-56, flies at regular intervals on the shuttle to calibrate ozone measurements made by the Total Ozone Mapping Spectrometer and other instruments. The Space Radar Laboratory, which will fly on the shuttle for the first time next year, will measure surface geology, vegetation and ocean circulation, taking advantage of the radar's ability to penetrate cloud cover.

The centerpiece of Mission to Planet Earth, however, is the Earth Observing System, a series of satellites carrying suites of instruments that will make simultaneous, global-scale observations of related environmental variables and climate.

The first EOS satellite is scheduled for launch in mid-1998. The EOS Data and Information System is an integral part of EOS, coming on line in the early 1990s to analyze existing data. Once the satellites are operating, EOS data will be made available to scientists around the world.

Several Earth probes—low-cost missions designed for small launch vehicles—will complement EOS' broad environmental picture with highly focused studies of early ozone levels. The first of these was launched aboard a Soviet Meteor-3 satellite in August 1991, and two more will be launched on U.S. and Japanese rockets.

TOMS/Meteor-3 data will be shared with Russian scientists and independently analyzed in both nations.

In the mid-1990s, the Tropical Rainfall Measuring Mission, a joint venture with Japan, will observe rainfall in Earth's low latitudes. More than two-thirds of the world's precipitation falls in the tropics, releasing the energy that powers atmospheric circulation. TRMM will make a systematic study of this element of Earth's climate.

The NASA Scatterometer will provide global measurements of sea surface winds. NSCAT, set for launch in 1995 on the Japanese Advanced Earth Observing Satellite, will improve understanding of the coupling of the oceans and the atmosphere. Measurements of surface winds will be used with higher altitude cloud measurements from other instruments to give a clearer picture of heat, water vapor and global aerosol distribution. ADEOS also will carry a TOMS instrument.

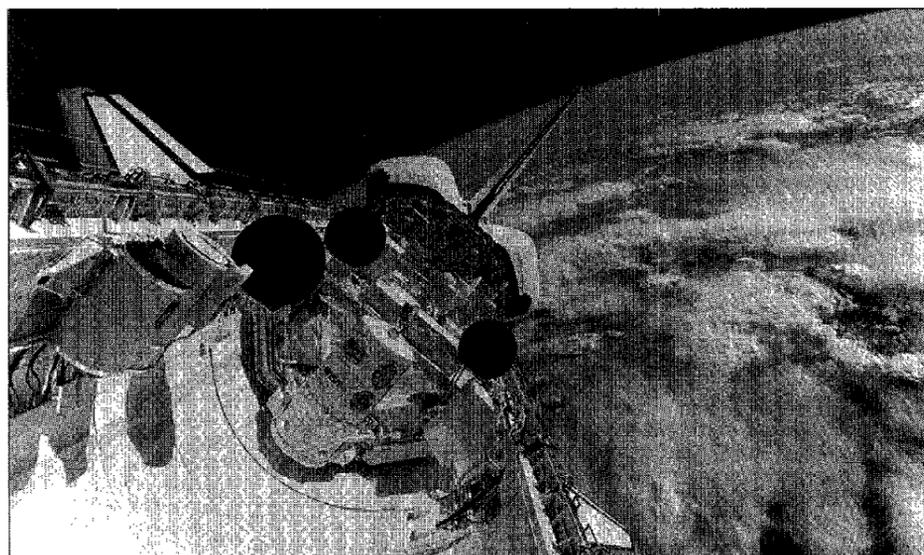
Mission to Planet Earth research is not conducted solely in space. Recent airborne expeditions have flown instruments to measure ozone-depletion processes in the Arctic and Antarctic. The Global Tropospheric Experiment has used airborne instruments to study trace gases in the lower atmosphere important to potential climate change, as well as the atmospheric effects of burning in the Amazon rain forest.

On the ground, NASA scientists continue to examine and re-examine existing data. Studies at the Goddard Institute for Space Studies and the Marshall Space Flight Center have expanded understanding of the global climate. Recent work at the Goddard Space Flight Center indicates that global ozone depletion is occurring at a faster rate than previously believed.

Mission to Planet Earth is NASA's contribution to the U.S. Global Change Research Program, a multi-agency effort to understand how the Earth changes over time. □

**'The vast loneliness up here on the moon is awe inspiring. It makes you realize what you have back on Earth. The Earth is a grand oasis in the big vastness of space.'**

— Astronaut Jim Lovell, Apollo 8



STS-45 carried both the ATLAS-1 (center) payload and the SSBUV (left) as part of the Mission to Planet Earth program.

**'We've seen things like deforestation. We've seen erosion, and we've seen some land usage that kind of disturbs us... Our environment is a very fragile thing.'**

— Astronaut Dave Hilmers, STS-26

# Leave policy designed to help parents cope

A new child can turn a household upside down with dirty diapers, midnight feedings and constant care. Those stresses can be magnified if a parent is concerned about leaving work to care for the baby.

JSC policies, however, are designed to make the transition a positive experience for both the parent and the organization.

In general, mothers and fathers may request leave in connection with the birth or adoption of a child. JSC's maternity and paternity leave policy emphasizes flexibility in order to accommodate the varying needs

of the employee and organization. The goal is to do as much as possible to reasonably accommodate parents of newborns and to help minimize stress on expectant and new parents.

The Human Resources Office recently produced a pamphlet that highlights some of the questions employees and supervisors ask about maternity and paternity leave.

At JSC, maternity leave is defined as "a leave of absence by a mother in connection with the birth or adoption of a child." Maternity leave for

the birth of a child can be covered by a combination of annual leave, compensatory time earned, leave without pay, sick leave, advanced sick leave and donated leave.

Maternity leave associated with the adoption of a child can be covered by a combination of annual leave, compensatory time earned and leave without pay.

Sick leave can be used only during the period of physical incapacitation as determined by the attending physician. Normally for delivery and recuperation, this period is six to eight weeks.

Paternity leave, defined similarly to maternity leave, can be covered by a combination of annual leave, compensatory time earned and leave without pay.

Mothers taking leave generally can expect approval for up to three months leave unless it would create undue hardship for the organization. JSC's policy sets an upper limit of one year for maternity leave. Paternity leave must be negotiated with the supervisor.

Parents also find themselves needing leave when a child is sick. JSC policy states that for routine ill-

ness—colds, ear infections, stomach ailments—and doctor's visits, employees must charge the absence to annual leave, compensatory time earned or leave without pay. If the child has a contagious disease such as the mumps or measles which public health officials require removal from school or day care facilities, parents may use sick leave.

Contact a Human Resources representative, supervisor, or administrative officer for assistance or additional questions concerning maternity or paternity leave.

## Cards used to improve ISD service

As computers more and more become a necessity rather than a luxury in the workplace, the Information Systems Directorate (ISD) is continuously looking for opportunities to improve service to the more than 8,000 personal computer users at JSC.

"One of ISD's primary objectives is to improve the quality and timeliness of the information technology services provided to JSC customers," said ISD Director Ron Berry. "One key to doing that is to obtain valid customer satisfaction feedback through the Customer Service Card."

The Customer Service Card is a blue response card left with each customer when an Information Systems Contract (ISC) representative completes any requested service.

The card provides an evaluation tool in categories such as response time, effectiveness, professionalism, courtesy and overall customer satisfaction. It also contains space for expanded comments about the service or other issues.

To date, ISD has received 250 out of 1,000 blue cards left by service representatives. The area rated the poorest is response time.

"We are aware that response time is a problem and are working to correct it," said Lou Devita, ISC director of Customer Services. "We are pleased to see other categories rated highly and will strive to achieve excellence in all areas of service."

Devita said if the rating on the returned card is below average, he personally calls the customer to discuss the service and possible improvements.

Berry also encouraged customers to complete and return these cards in an objective and timely manner because appropriate actions will be taken to improve future service based on what is learned from the cards.

"We are treating customer satisfaction very seriously and the cards help us measure how well we're doing," Berry said.

## Self-defense class set for Wednesday

Those wanting to learn how to fend off an attacker will have the opportunity to learn self-defense techniques during a free workshop this week at the Gilruth Center.

The workshop, which was offered for the first time last year, will be conducted from 5-6 p.m. Thursday at the Gilruth Center. The session will be led by Aikido Instructor Leon Blum.

To reserve a place in the class, call x30304.

## Correction

In the April 12th edition, the Space News Roundup incorrectly indicated that the Spring 1993 Co-op Job Fair would be April 15. The Job Fair will be this Thursday, April 22, from 10 a.m.-4 p.m. in the Gilruth Center gymnasium.

All managers and colleges that participate in the co-op program have been invited to participate, and anyone who is interested may attend.



CHECKING IT OUT—The Astronaut Class of 1993, including Chris Hadfield, left, and Scott Horowitz, recently touring Boeing's Flight Equipment Processing Lab. The orientation session included discussions of FEPC mission processing operations, crew training support, the extravehicular mobility unit, the launch/entry suit, crew clothing, the shuttle food system and other equipment usually stowed in middeck lockers.

## Savings bond campaign starts

Savings bonds are considered by many to be a unique investment opportunity, and JSC employees will be able to take full advantage of that opportunity during the center's annual U.S. Savings Bond Campaign.

"The purchase of U.S. Savings Bonds is an investment in tomorrow," said JSC Director Aaron Cohen. "It helps to reduce the cost of government financing and as representative of the federal government, we must set the standard for such an important national concern."

The purchase of savings bonds is a transaction in which both the buyer and seller profit. Interest rates are market based, climbing as market rates increase but with a floor of 4 percent on bonds held six months or

longer. The current six-month rate is 5.04 percent.

Interest earned on savings bonds is not subject to state or local taxes, and the federal tax liability can be deferred until the bonds are cashed. The interest earned on bonds redeemed for financing higher education is completely tax free.

The JSC bond campaign begins May 5 and will run through May 21. NASA's goal is 40-percent participation with a 10 percent increase in the number of new savers and with at least 20 percent of the current bond buyers increasing their existing allotments.

For more information, contact the directorate campaign coordinator for Teresa Sullivan at x38970.

## ATLAS-2 comes to close

(Continued from Page 1) atmosphere and change the way we do things on Earth."

Crew members also deployed and retrieved the SPARTAN-201 satellite. SPARTAN spent about 48 hours free of the shuttle investigating features such as holes and streamers in the Sun's corona.

Though the deployed operations went smoothly, the success of SPARTAN's mission will not be known until researchers retrieve the information from the spacecraft's data recorders.

Discovery also carried eight secondary payloads on the middeck including the HERCULES Earth observation system. HERCULES is comprised of a camera and geolocation device which was able to pinpoint features on the Earth's surface to within tenths miles in some cases.

More than 150 Hercules photos were sent to the ground during the

mission including views of New York; Atlanta; Bonn, Germany; the coast of Peru; Mozambique; and Darwin and Melbourne, Australia.

When not involved with their payload activities, crew members talked with ham radio operators using the Shuttle Amateur Radio Experiment.

Besides contacting students around the world, the STS-56 crew logged two firsts for SAREX.

Foale talked with cosmonauts on the Russian space station Mir, and Cameron got a look at Mission Control when operators sent NASA Select to the orbiter using slow scan television equipment.

"Hey Sam, wave your hands," Cameron said to Capcom Sam Gemar. "Wave your hands real big. I can see you on television. Tell the flight director I can watch him every minute. We've got you both. ...I guess this is a first where we get to watch you."

## UHCL conducts registration for engineering courses

In cooperation with the Cullen School of Engineering, JSC again will offer graduate engineering courses during the summer and fall terms at the University of Houston-Clear Lake.

Onsite registration for the classes will be conducted from 10:30 a.m. to 2 p.m. April 28 in the Bldg. 45 lobby. The university will require payment at the time of registration, but JSC employees may submit a completed Form 75 (Application for Training) as payment.

All applicants for admission and all new students must bring their undergraduate transcripts with the degree posted. All new students should remember that only six hours taken as a post-baccalaureate student may be transferred to graduate credit.

During the summer, three classes will be offered as television courses at JSC. They are Advanced Digital Design, 6-8 p.m., Monday and Wednesday; Digital Signal Processing, 4-6 p.m., Monday and Wednesday; and Engineering Economy

II, 4-6 p.m. Tuesday and Thursday.

In the Fall, UHCL will offer one class in industrial engineering and two in aerospace engineering. The classes are Reliability and Quality Control, 4-7 p.m., Wednesday; Propulsion Engines, 4-7 p.m., Tuesday; and Orbital Mechanics I, 4-7 p.m. Thursday.

A total of six television classes will be offered during the Fall Semester. They are Neural Networks, noon-1:30 p.m., Monday and Wednesday; Advanced Microprocessor Systems, 11:30 a.m. -1 p.m., Tuesday and Thursday; Digital Image Processing, 5:30-7 p.m., Monday and Wednesday; Methods of Applied Mathematics, 4-5:30, Monday and Wednesday; Engineering Project Management, 4-5:30 p.m., Tuesday and Thursday; and Operations Research and Analysis/Systems, 5:30-7 p.m., Tuesday and Thursday.

Registration forms are available in the Human Resources Development Branch. For more information, contact the Cullen College of Engineering at 743-4200.

## Students to learn about management by watching supervisors at work

JSC's National Management Association is hosting its sixth annual Management Experience Day Wednesday.

Twenty-five students and five teachers from high schools in the Houston area will spend the day touring the center and watching JSC managers and supervisors in action.

"We hope to expose students and teachers to JSC and its daily operations and hopefully spark an interest

in pursuing technical and managerial careers," said Richard Regenburgh III, the JSC chapter president.

At the end of the day, Linda Godwin, deputy chief of the Astronaut Office, will speak to participants at 4 p.m. in Bldg. 1, Room 966. A short reception will follow.

All NMA members are invited to the afternoon session. For more information, contact Natalie Saiz at x33035 or Debbie Denton at x33038.

## Plan cuts \$15 billion in five years

(Continued from Page 1)

Other savings were found by terminating the National Launch System and the Space Exploration Initiative previously marked for \$3 billion and \$500 million, respectively.

Other miscellaneous cuts save an additional \$3.5 billion, bringing the overall reduction to \$23.8 billion for five years.

The \$8.1 billion in items added back into the budget represent advances in technology and the birth of new programs.

"Although we have reduced shuttle costs by \$3.4 billion over the planning period, we remain committed to shuttle safety and technology upgrades," Goldin said. "We are investing in a more reliable main engine, on top of the avionics upgrades we are making in this

year's budget. This plan also allows us to invest in the technology for a 30-day Long Duration Orbiter and finances mission to Russia's Mir space station in 1994 and 1995."

The "add backs" also include funds for the Gravity Probe-B, a physics experiment to verify Einstein's theories of relativity; augmentations to the aeronautical programs; and technology investments that could reinvigorate the nation's industrial base and enhance America's competitive in the global marketplace.

"This budget speaks to America's long term interests in the exploration of air and space," Goldin said. "If we are bold and innovative, NASA can be a shining light. We can rekindle the American economic engine and the American spirit."

## Graphics support relocates onsite

To improve the effectiveness of its support to the center, several graphics production locations have been consolidated and moved to Bldg. 227, the East entrance.

Customers can bring their requirements to this location or to other publication work control centers in Bldg. 1, Room 106B, or Bldg. 45, Room 244.

For more information, call x30700 or x30293.

## Space News Roundup

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